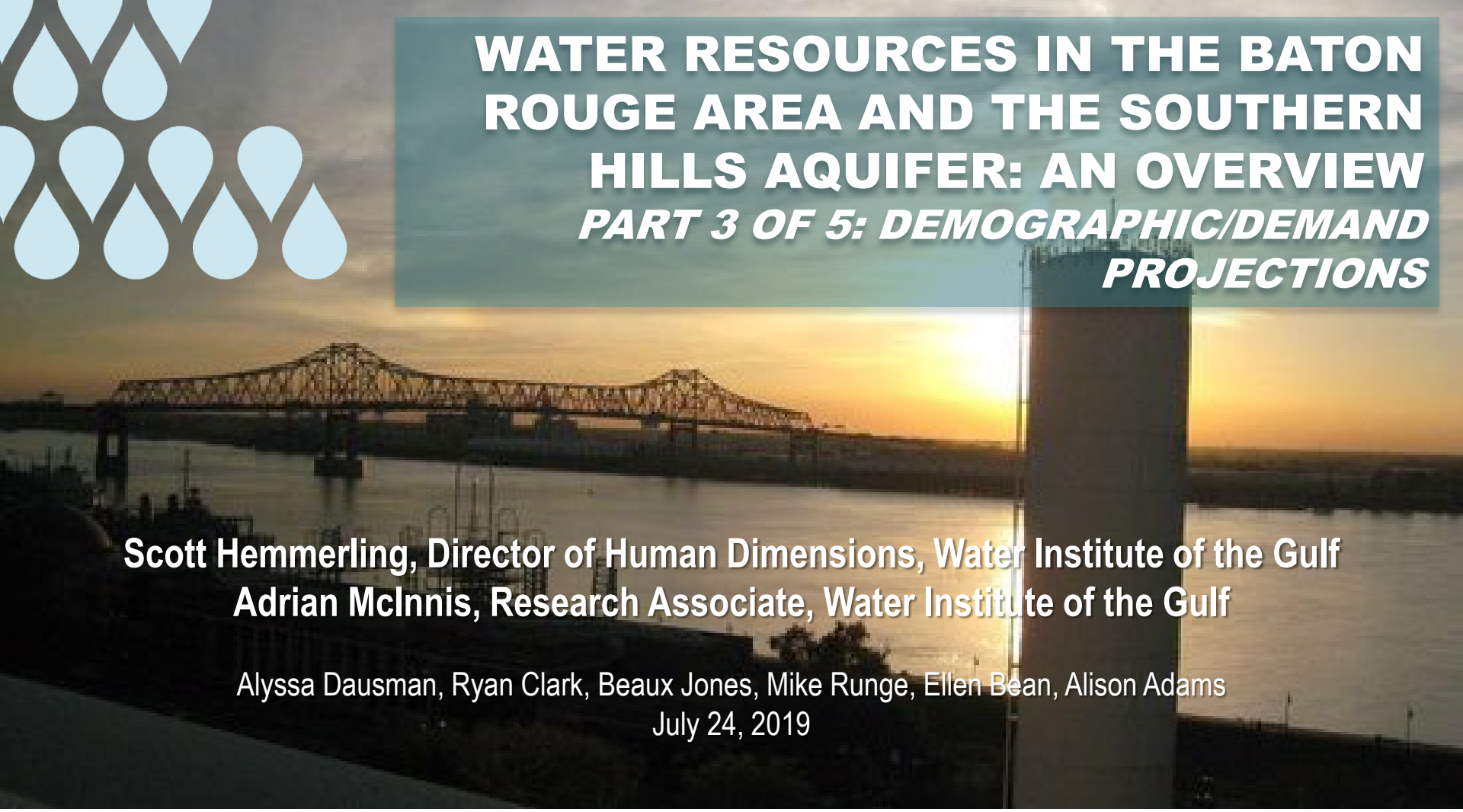

WATER RESOURCES IN THE BATON ROUGE AREA AND THE SOUTHERN HILLS AQUIFER: AN OVERVIEW

PART 3 OF 5: DEMOGRAPHIC/DEMAND PROJECTIONS

Scott Hemmerling, Director of Human Dimensions, Water Institute of the Gulf
Adrian McInnis, Research Associate, Water Institute of the Gulf

Alyssa Dausman, Ryan Clark, Beaux Jones, Mike Runge, Ellen Bean, Alison Adams

July 24, 2019

CAPITAL AREA GROUND WATER CONSERVATION COMMISSION

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CPRA

ACKNOWLEDGEMENTS

- Capital Area Groundwater Conservation Commission
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  - Lower Mississippi Gulf Water Science Center
- Technical Team
  - Mike Runge, USGS
  - Ellen Bean
  - Alison Adams, INTERA
  - Alyssa Dausman
  - Adrian McInnis
  - Ryan Clark
  - Beaux Jones
  - Scott Hemmerling

OVERVIEW

- Legal Framework for Decision Making
- ***Water Resources Demand in the Capital Area***
- Aquifer Dynamics & Water Supply
- The Southern Hills Aquifer System

WATER RESOURCES DEMAND IN THE CAPITAL AREA

Long-term water resource planning requires understanding and forecasting future demand

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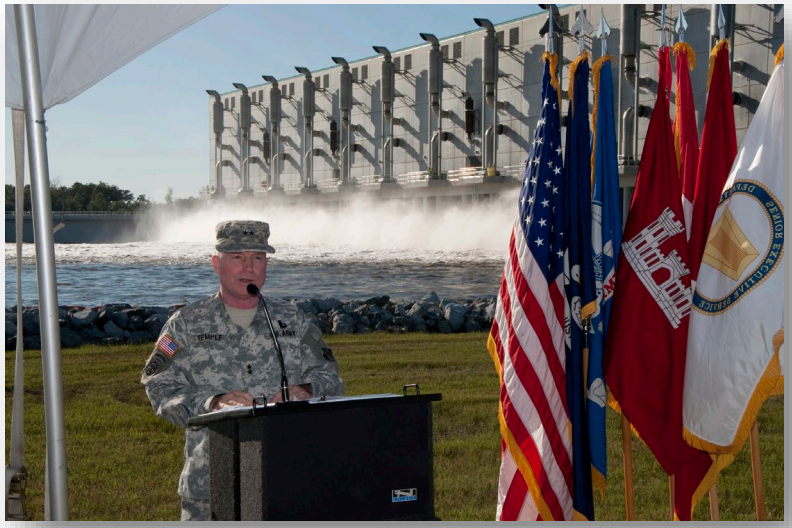
WATER MANAGEMENT IN LOUISIANA

"But, Louisiana has *too much* water…"

- Floods
- Rainfall
- Bayous
- Seafood
- Mississippi River
- Not all water is the same
- Drought
- Local impacts
- Climate change
- Coast – environmental flows



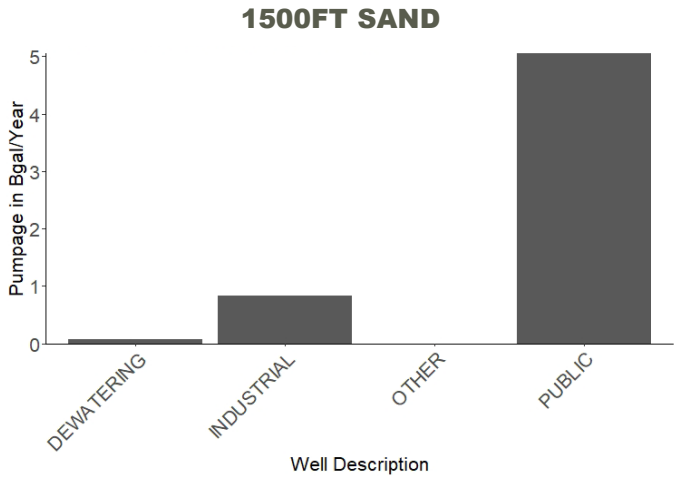
LONG TERM DEMAND

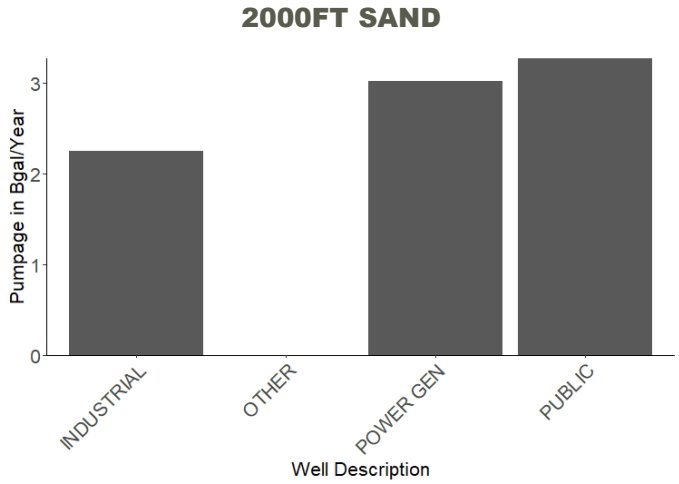
How are water resources considered on decadal (50-100 year) timescales?

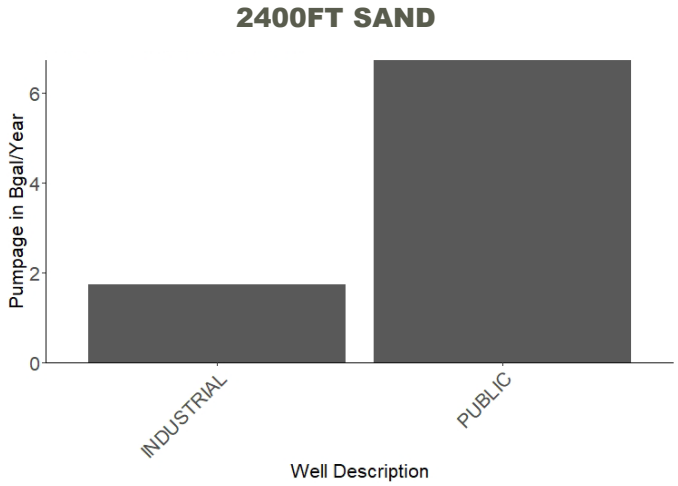
Will the supply of water (groundwater or other sources) meet the demand?

AQUIFER USES - 2018

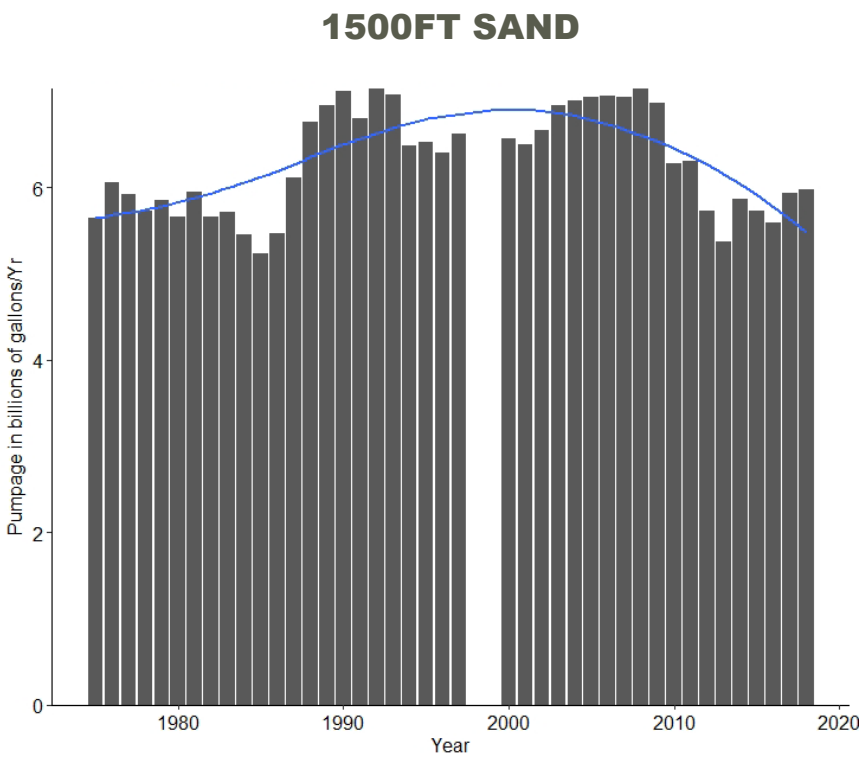
1500ft – Public
2000ft – Public
2400ft – Public

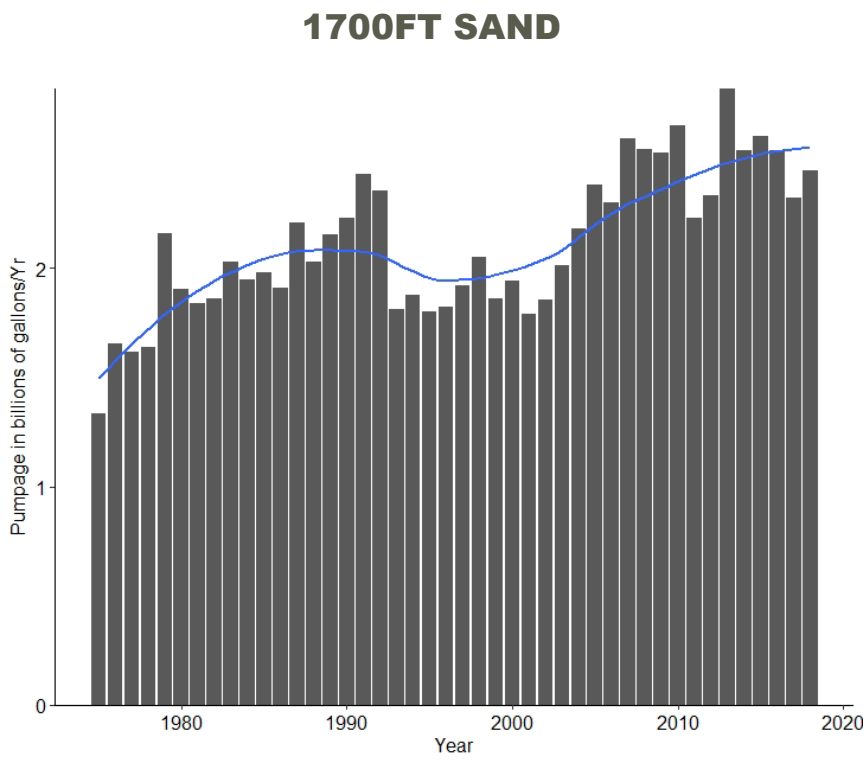




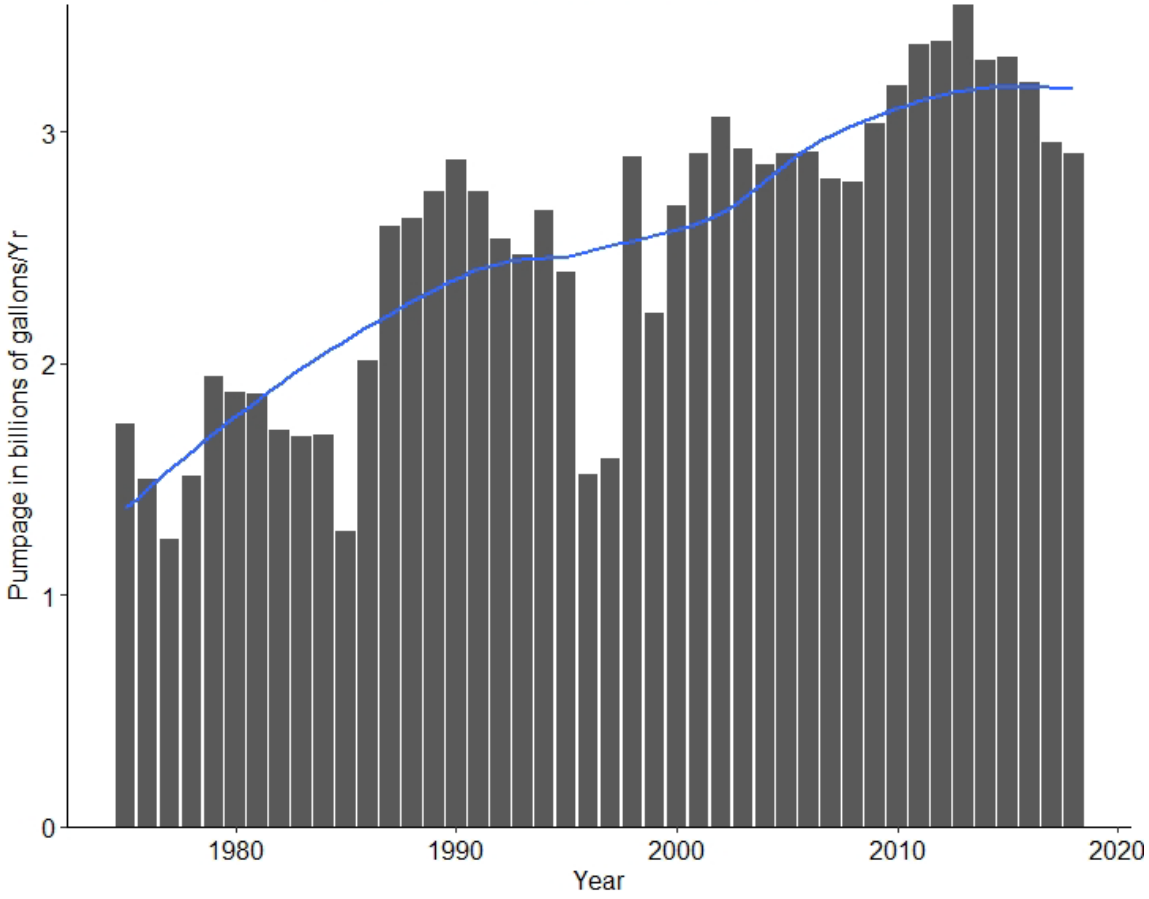


AQUIFER USAGE
1500 & 1700FT SAND

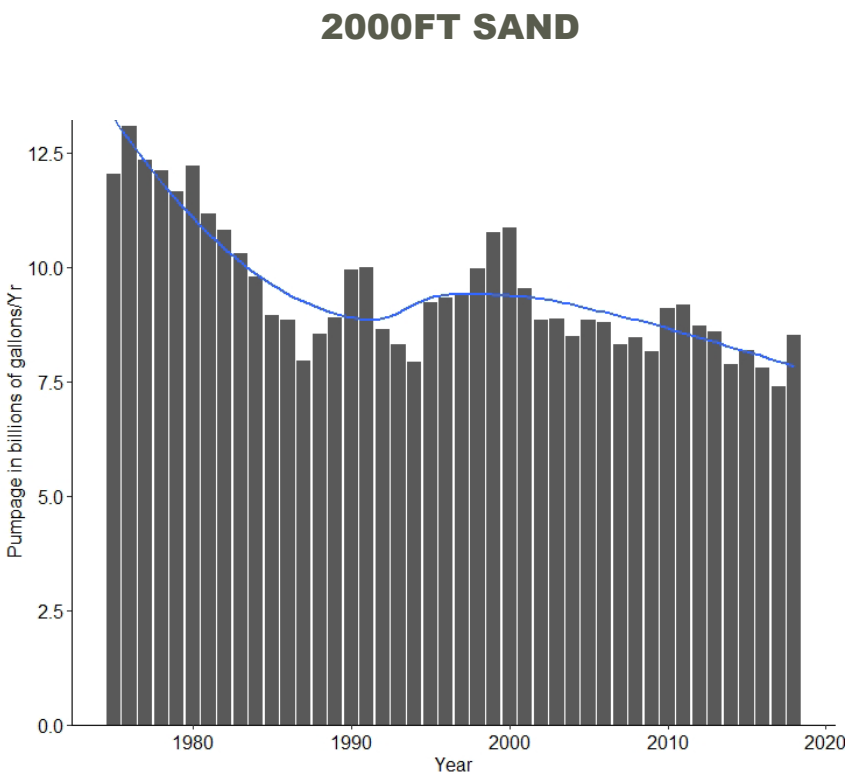


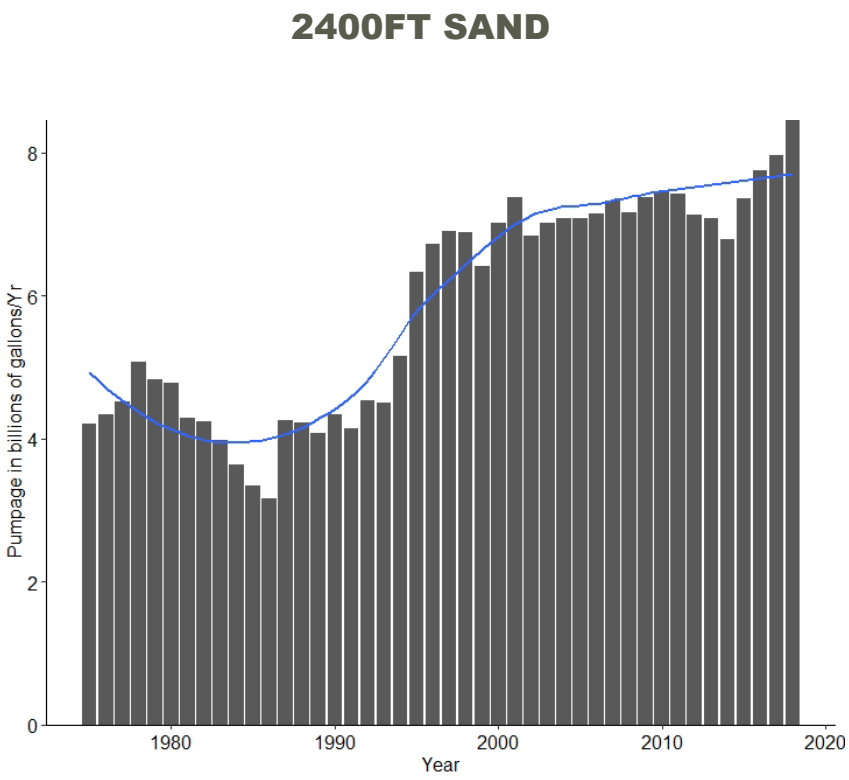


1500-1700FT SAND

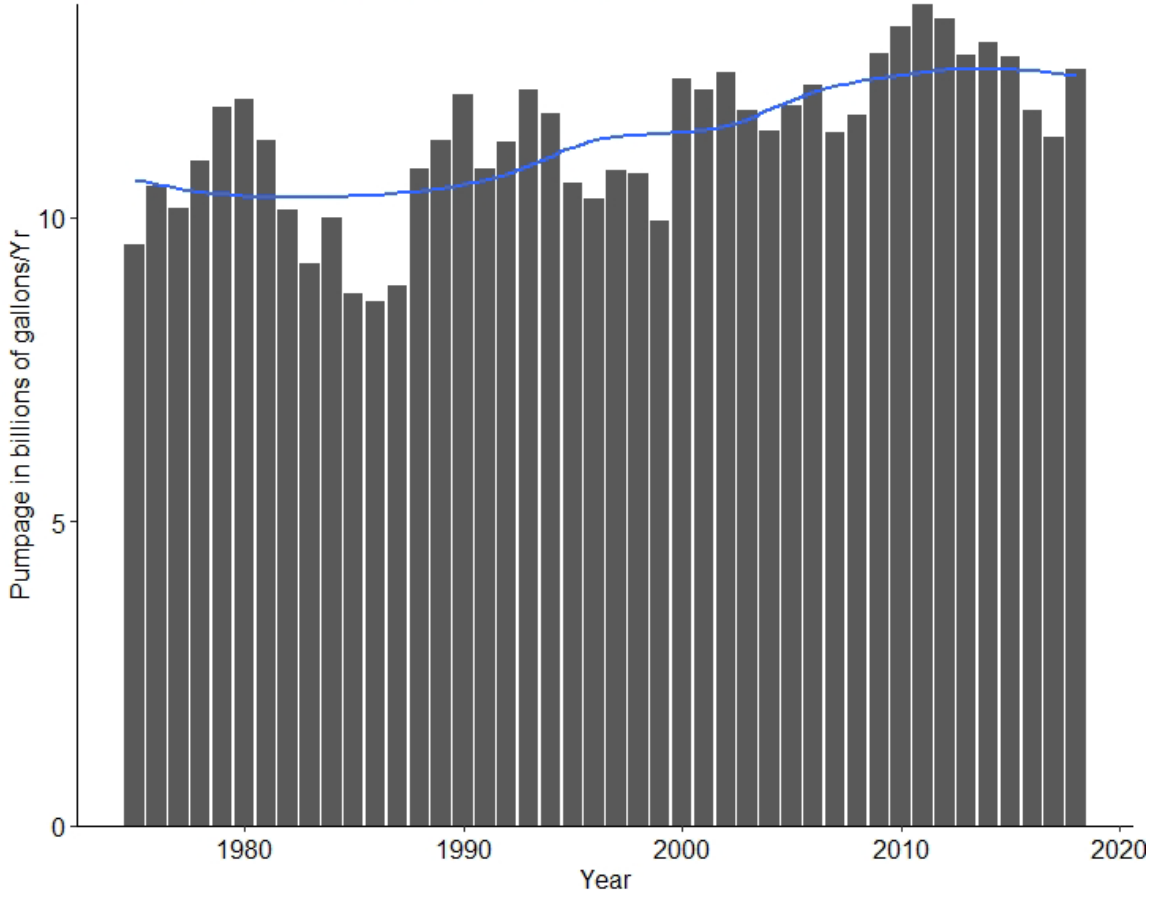


2000, 2400FT SAND



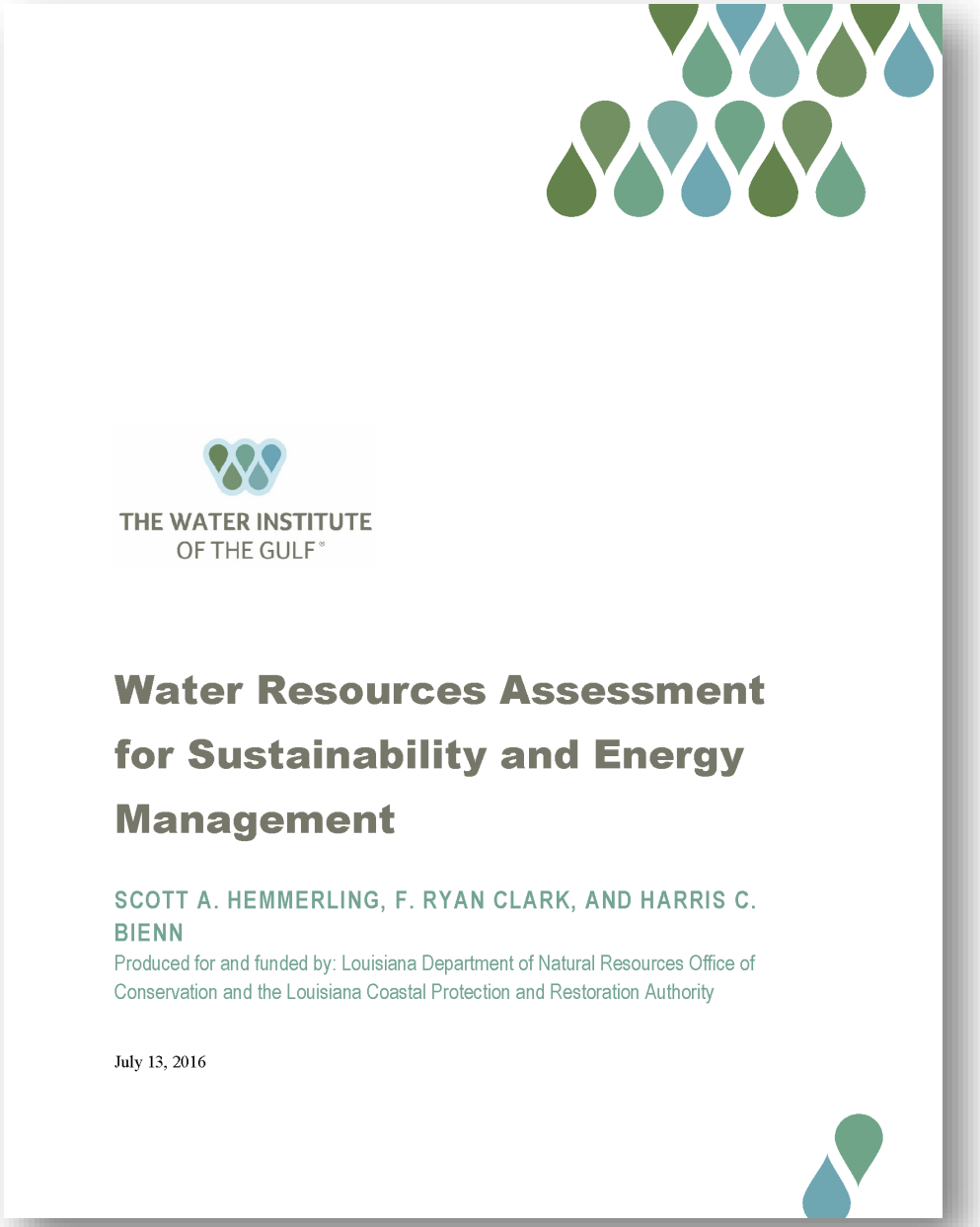


2800FT SAND


Pumpage in billions of gallons/Yr
10
5
0
1980
1990
2000
2010
2020
Year

PREVIOUS STUDY

- Developed a statewide assessment framework to supports the effective management of Louisiana's water resources.
- Conjunctively appraised supply and demand in both ground and surface water units and provided a means to estimate the energy costs associated with water resources use.
- The statewide assessment framework was tested in three different areas of the state
  - **Chicot Aquifer** and the Bayou Teche and Vermilion River surface watersheds
  - **Carrizo-Wilcox Aquifer** and the Red River surface watershed
  - **Southern Hills Aquifer** bounded by the Mississippi River on the west and the Tangipahoa River on the east.



Hemmerling, Clark, & Bienn, 2016

STUDY AREA: SELA

- Western Southern Hills Aquifer System
- Surface water basins:
  - Lower Mississippi-Baton Rouge
  - Tickfaw River
  - Bayou Sara-Thompson
  - Amite
- Mix of demand uses
  - Industry
  - Urban/rural domestic

Total Water Balance in Southeast Louisiana Study Area by HUC8

Hemmerling, Clark, & Bienn, 2016

STUDY AREA: SELA

- Overall water surplus – not including flow of the Mississippi River
- Mississippi River at BR:

  383,638,642 ac-ft/yr
- Groundwater estimated inflow from recharge:

  629,470 ac-ft/yr
- All groundwater used = 0.065% of the annual flow of the Mississippi River

Total Water Balance in Southeast Louisiana Study Area by HUC8

Hemmerling, Clark, & Bienn, 2016

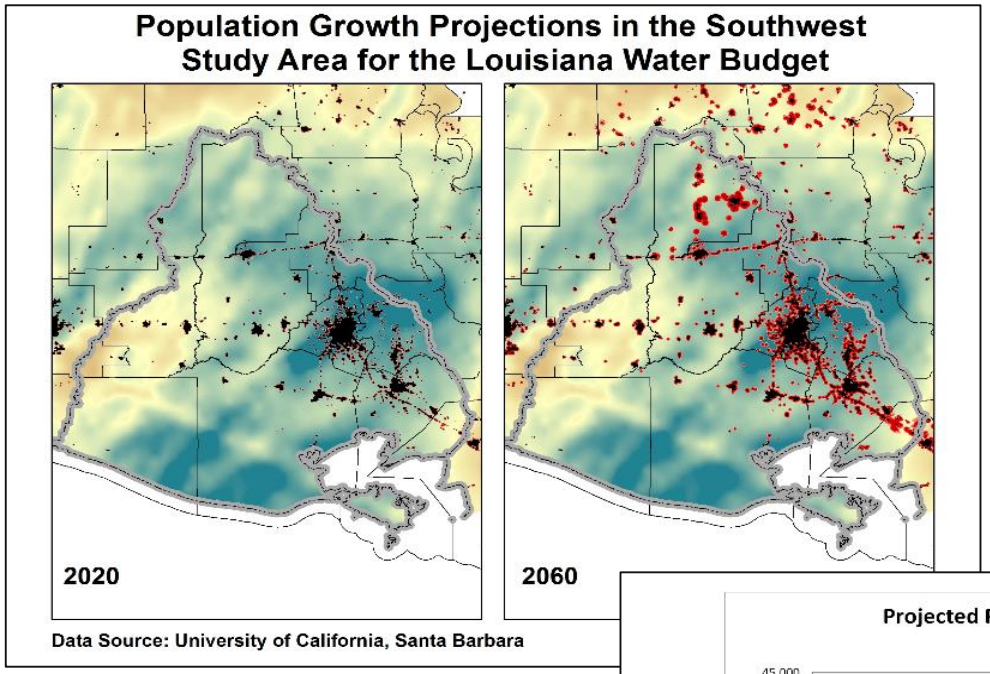
WATER BALANCE RESULTS

- Groundwater use:
  - Estimated groundwater usage/outflow: 665,600 ac-ft/yr
  - Estimated groundwater deficit: 36,130 ac-ft/yr
- Industrial withdrawals account for 63.8% of all groundwater use in the Bayou Sara-Thompson watershed, the watershed
- Public supply accounts for 80.2% of all groundwater use in the Amite watershed

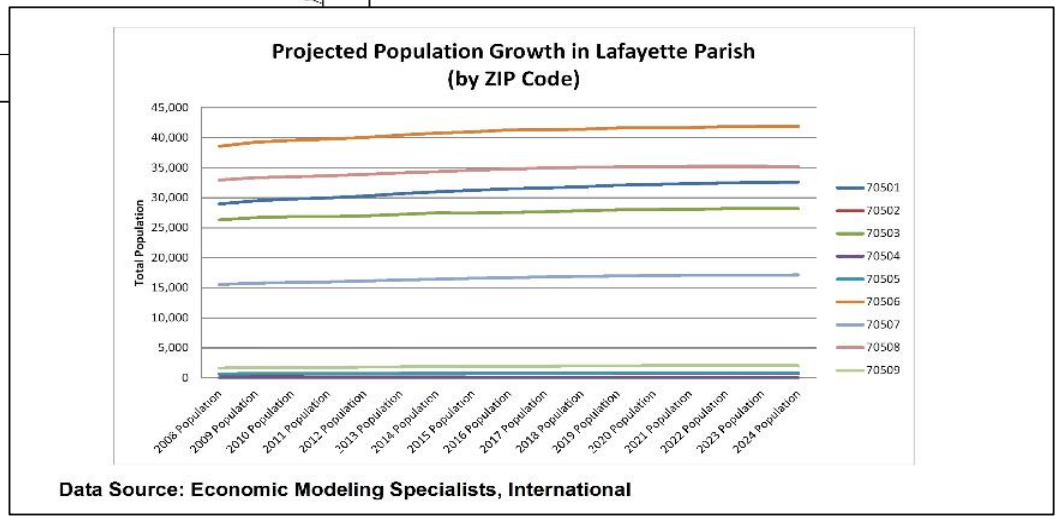
Groundwater Balance in Southeast Louisiana Study Area by HUC8

Hemmerling, Clark, & Bienn, 2016

FUTURE PROJECTIONS

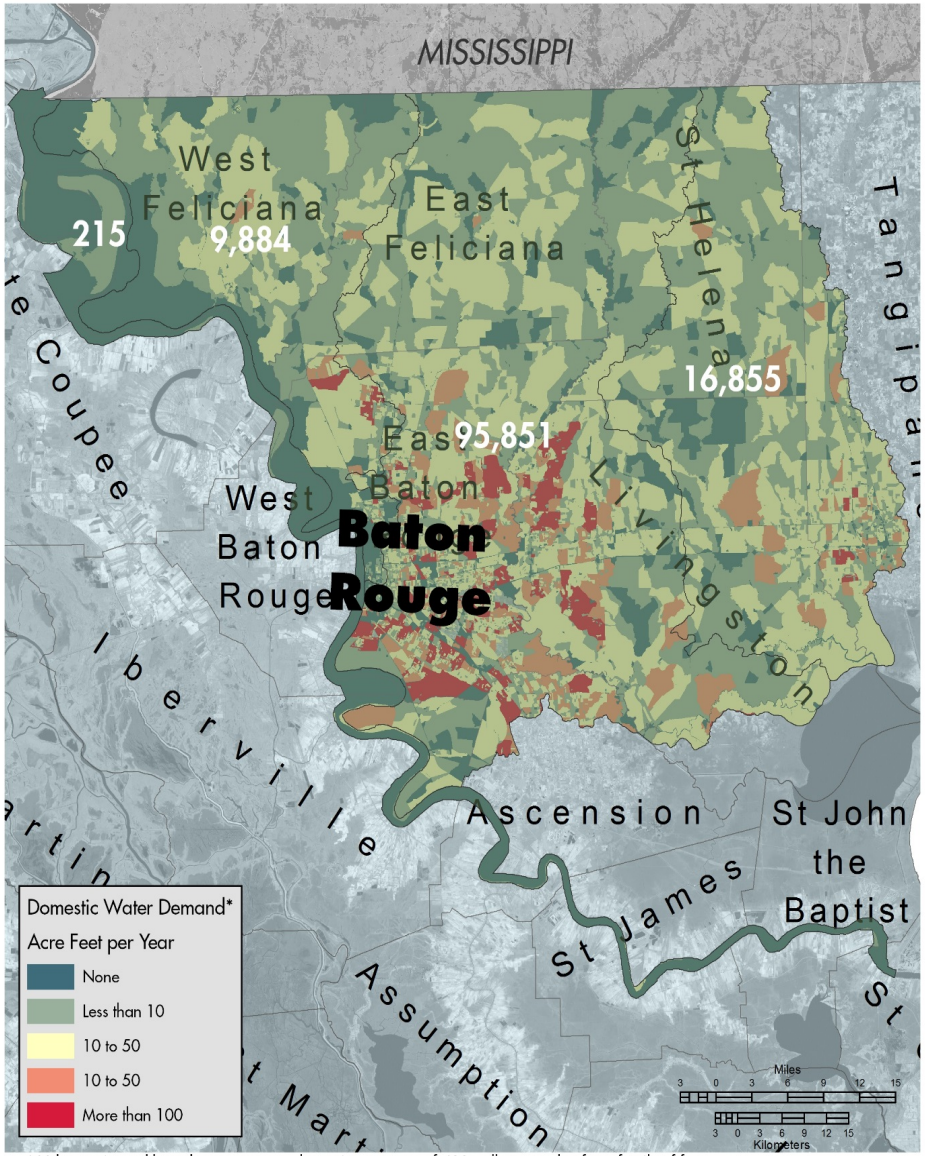


Impacts of population growth and urbanization on water supply and demand



Hemmerling, Clark, & Bienn, 2016

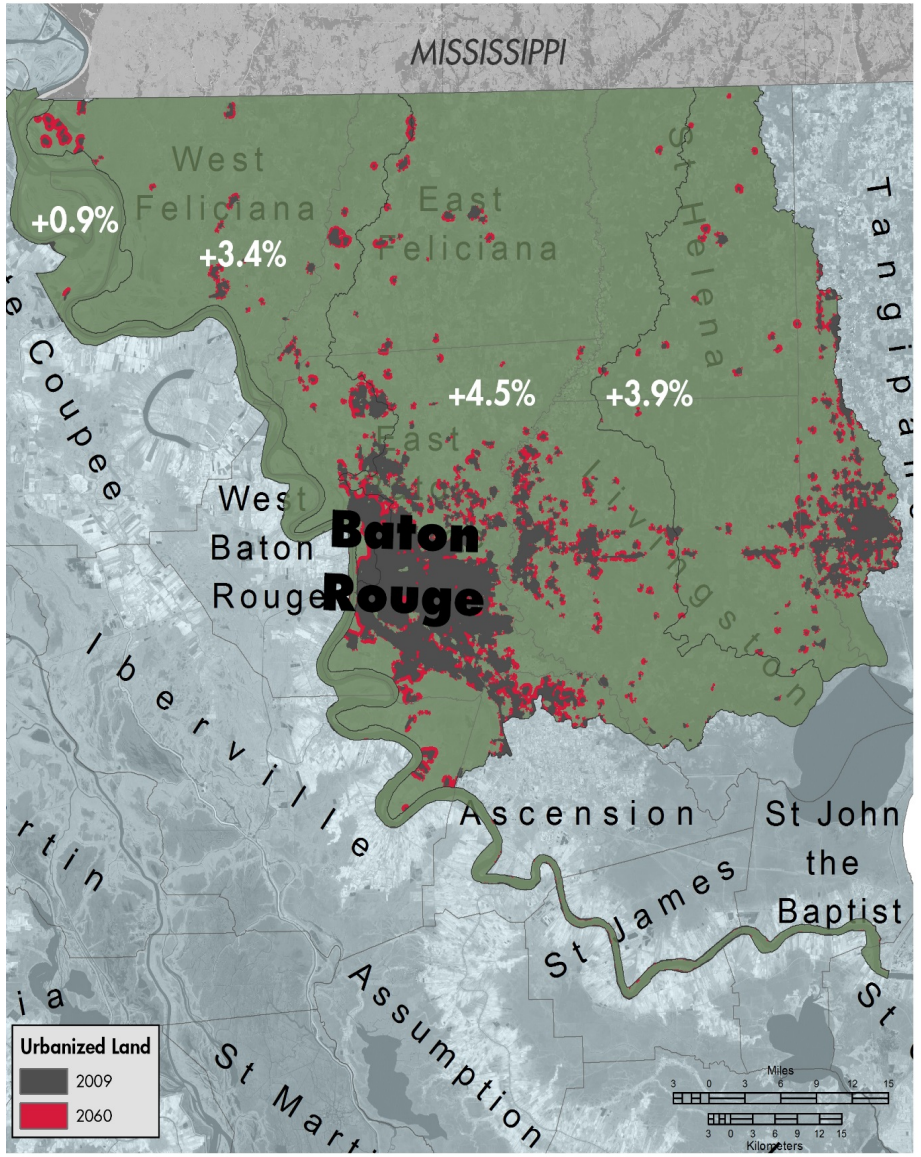
Estimated Annual Household Demand for Fresh Water by HUC8 (2010)



* Values estimated based upon average domestic water use of 400 gallons per day for a family of four

Data Source: U.S. Census Bureau

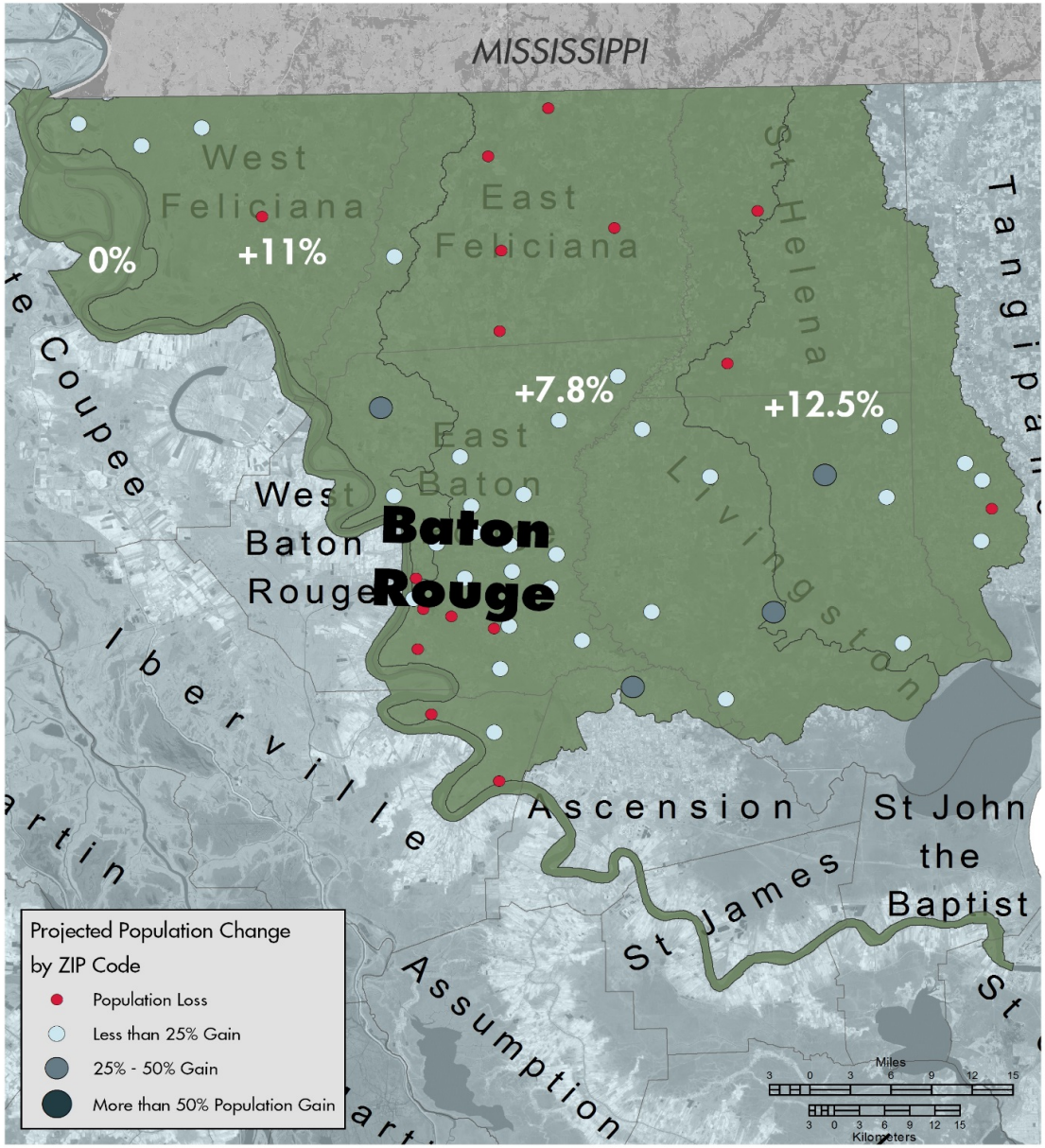
Projected Urban Growth in Southeast Louisiana Study Area (2009-2060)



Data Source: North Carolina State University Biodiversity and Spatial Analysis Center

Hemmerling, Clark, & Bienn, 2016

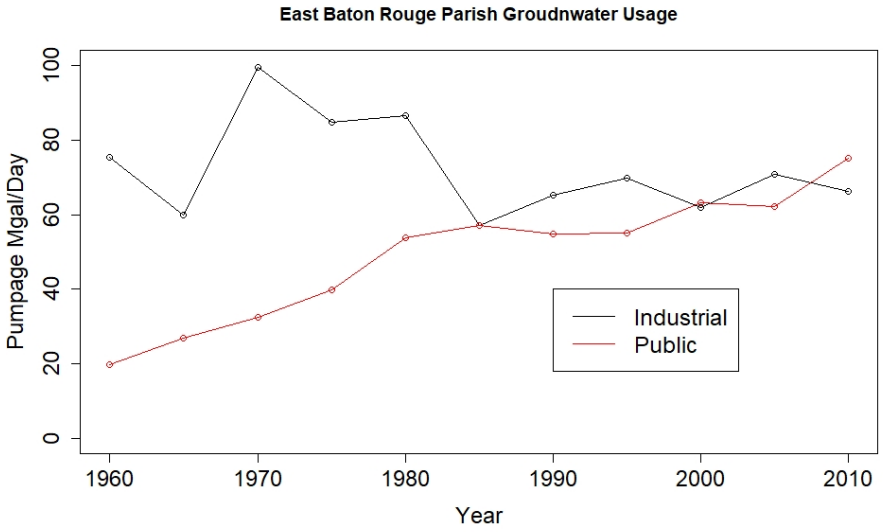
Projected 10-year Population Change by ZIP Code

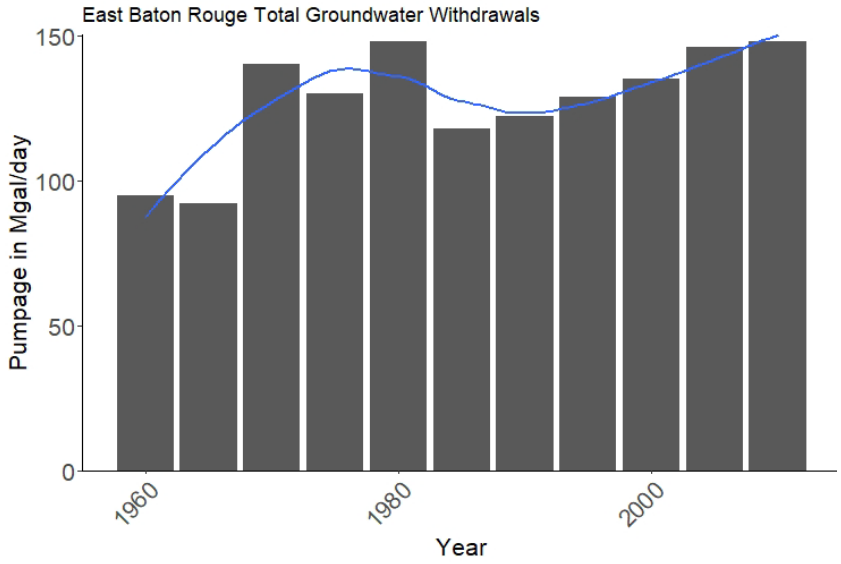


Data Source: Economic Modeling Specialists, International; Lousiana Economic Development

Hemmerling, Clark, & Bienn, 2016

EAST BATON ROUGE PARISH WATER USE





https://la.water.usgs.gov/https://la.water.usgs.gov/WaterUse/charts/chart_dataMap.asp?Parish=East_Baton_RougeWaterUse/charts/chart_dataMap.asp?Parish=East_Baton_Rouge

ECONOMIC DEVELOPMENT BATON ROUGE AREA

- Industrial expansions will drive the Baton Rouge to the 2nd fastest growing region in Louisiana (1.7 percent per year over 2019-20).
- $18.9 billion in announced industrial expansions in this MSA since 2012.
- Baton Rouge MSA Non-Farm Employment Forecast:
  - 2020: +8,100 jobs (1.9%)

- Example industrial expansions:
  - Shell LNG
  - ExxonMobil – polyethylene plant
  - Renewable Energy – animal fat fuel
  - Shell Chemical LP Geismar - $717 M
  - OxyChem – $145 M
  - Ascension Parish Construction – through 2020, $150 M

Shell's Geismar chemicals manufacturing site

Data Source: Louisiana Department of Economics & Shell.com

DEMAND INTO THE FUTURE

- Long-term water resource planning should consider both population growth and industry growth.
- Also to consider:
  - The benefits and limitations of demand forecasts.
  - Sources of uncertainty and how to address that in forecasting demand.
- Data needs:
  - Average household consumption
  - Industrial consumption

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THANK YOU

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